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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,871	04/17/2001	Jeffrey H. Price	PRICE1220-1	8139

25548 7590 02/11/2003
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EXAMINER

YAM, STEPHEN K

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 02/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/837,871

Applicant(s)

PRICE, JEFFREY H.

Examiner

Stephen Yam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

This action is in response to Amendments and remarks filed on December 10, 2002. Claims 1-29 are currently pending.

Claim Objections

1. Claim 23 is objected to because of the following informalities:

In Claim 23, "the selection optics" lacks proper antecedent basis, as prior references use the term "the light selection optics".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 4-10, 12, 16-17, 21-24, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Campanelli et al. US Patent No. 6,024,283.

Regarding Claims 1, 21, and 24, Campanelli et al. teach (see Fig. 3b) a system and method for imaging of a sample comprising a plurality of detectors (45) each focused at a respective focal plane in a sample volume (43) (see Col. 7, lines 23-27), and light selection optics (42) positioned between the plurality of detectors and the sample volume for transmitting (see Col. 7, lines 10-15) to the detectors a portion of the light originating at the respective focal

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planes while screening out light originating outside the respective focal planes, where each detector is an area array sensor (each row of detector elements).

Regarding Claims 2, 4 and 8, Campanelli et al. teach the light selection optics as DMD elements (see Col. 7, lines 35-60)- inherently, DMD elements are electrically controlled mirrors that are controllably switched to ON and OFF positions, where each DMD element is individually controlled to adjust the pitch of the mirror, to selectively transmit or block incident light, and that switching between ON and OFF will respectively transmit or block the light to the reading elements (see also Col.8, lines 38-42).

Regarding Claim 5-7, Campanelli et al. teach the patterns controlling (see Col. 7, lines 23-34 and 39-45) a degree of confocality for each detector concurrently in the plurality of detectors (see Col. 7, lines 23-34).

Regarding Claim 9, Campanelli et al. teach each detector focused (see Col. 7, lines 23-26 and 30-34) on a different region of the sample and the light selection optics selects (See Col. 7, lines 30-34) the portion of each region viewed by the detector focused on the region.

Regarding Claim 10, Campanelli et al. teach (see Fig. 3b) focus differentiation optics (42) which causes each detector to be focused at different planes (see Col. 7, lines 30-34) within the sample.

Regarding Claim 12, Campanelli et al. teach (see Fig. 3b) each detector (45) positioned equidistant from the focus differentiation optics (42).

Regarding Claim 16, Campanelli et al. teach (see Fig. 3b) a light source (47) and optics (42) to illuminate the bar code (43) and transfer reflected light to the detectors.

Regarding Claim 17, Campanelli et al. teach (see Fig. 3c) relay optics (38) between the light selection optics (35) and the detectors (36).

Regarding Claim 22, inherently, a detector captures data using time-delay-and-integration methods, with a capacitive element to accumulate and store data over a short delay of time.

Regarding Claim 23, Campanelli et al. teach a DMD array for focusing- inherently, a focusing mechanism directs light at a specific focal length through the mechanism, while mostly blocking light from other focal lengths, thereby producing a clear image at a specific focal length.

Regarding Claim 26, Campanelli et al. teach (see Fig. 4) providing (see Col. 9, lines 16-22) output from each detector to a processing (140), display (149), and storage (RAM memory within a CPU (140)) system.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 11, 13-15, and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Campanelli et al.

Regarding Claim 3, Campanelli et al. teach the system as taught in Claim 1, according to the appropriate paragraph above. Campanelli et al. also teach a laser light source (10) to illuminate the bar code. Campanelli et al. does not teach the laser emitting a pulsed pattern, or providing

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multiphoton fluorescence. It is well known to use a pulsed pattern with multiphoton fluorescence for a laser in an imaging device. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the laser of Campanelli et al. in a pulse pattern due to design choice, and to provide multiphoton fluorescence to provide a greater resolution due to detecting varying wavelengths of light.

Regarding Claims 11 and 13-14, Campanelli et al. teach the system as taught in Claim 10, according to the appropriate paragraph above. Campanelli et al. do not teach the ability to adjust each lens in the focus differentiation optics, or the specific construction of the focus differentiation optics. It is well known to adjust the focal length for a lens by movement of the lens in the direction of the optical path. It is design choice to contain at least one first side and a plurality of second sides, where each second side is positioned at a different distance from the at least one first side, and each second side is substantially parallel to one of the at least one first side. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Campanelli et al. with the ability to move the array of lenses in the direction of the optical path, and with at least one first side and a plurality of second sides, to adjust the focal length through differing lens thickness and position.

Regarding Claim 15, Campanelli et al. teach the system as taught in Claim 1, according to the appropriate paragraph above. Campanelli et al. do not disclose a light source causing fluorescence within a dye. It is common knowledge that sections of a bar code will fluoresce with incident light, due to the printing dyes of the barcode. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a light source and optics to

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illuminate the barcode, to accurately image the fluorescence transmitted by sections of the barcode.

Regarding Claim 18, Campanelli et al. teach the system as taught in Claim 1, according to the appropriate paragraph above. Campanelli et al. do not teach magnification adjustment optics to compensate for differences in magnification from each detector. It is well known to use magnification optics to correct optical errors due to parallax or optical defects. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include magnification adjustment optics in the device of Campanelli et al., to correct magnification aberrations for high-accuracy detection.

5. Claims 19 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Campanelli et al. in view of Litsche et al. US Patent No. 5,838,538.

Regarding Claims 19 and 25, Campanelli et al. teach the system and method as taught in Claims 1 and 24, according to the appropriate paragraph above. Campanelli et al. do not teach a sample fixture for holding and scanning the sample. Litsche et al. teach (see Fig. 2) a barcode-scanning apparatus with a holding device (1) (see Col. 1, line 53-54) and a first (11) and second (21) drive motor (see Col. 1, lines 58-60) to move an object (2) containing a barcode (6) across a scanning device (see Col. 1, lines 61-63). It would have been obvious to modify the device of Campanelli et al. with the holding device and scanning drive elements of Litsche et al., to provide the ability to read multiple linear barcodes, as taught by Litsche et al. (see Col. 1, lines 44-45 and 48-51).

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6. Claims 20 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Campanelli et al. in view of Ni US Patent No. 6,382,510.

Regarding Claims 20 and 27, Campanelli et al. teach the system and method as taught in Claims 1 and 26, according to the appropriate paragraph above. Campanelli et al. do not teach a processing system for processing and displaying of outputs as a three-dimensional image. Ni teaches (see Fig. 2) an apparatus to inspect a three-dimensional object (11) having a barcode (see Col. 2, lines 15-19), by producing (12) three-dimensional images (see Fig. 3a-3f and 4a-4d) of the inspected object (see Col. 1, lines 63-65). Regarding Claim 20, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the elements of Campanelli et al. with the three-dimensional scanning abilities of Ni to provide means for processing and displaying a three-dimensional image, to locate and subsequently scan and process the barcode. Regarding Claim 27, it would have been obvious to one of ordinary skill in the art at the time the invention was made to filter the detector output from the modified elements of Campanelli et al. in view of Ni, to discard extraneous information retrieved from the three-dimensional scanning.

Regarding Claim 28, Campanelli et al. in view of Ni teach the method as taught in Claim 27, according to the appropriate paragraph above. Campanelli et al. do not teach the segmenting of a 3D image into 3D objects. Ni teaches (see Fig. 1) a processing device (14) to process the retrieved images and segment (102) (see Fig. 2) them to be separately processed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the processing system in the modified invention of Campanelli et al. in view of Ni to segment the 3D

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image into 3D objects, so that each segment is separately processed to localize the barcode (108) (see Fig. 2).

Regarding Claim 29, Campanelli et al. in view of Ni teach the method as taught in Claim 28, according to the appropriate paragraph above. Campanelli et al. do not teach the classification of objects into types based on measurement processing. Ni teaches the comparison of the inspected object image with a reference object image (112) (see Fig. 2), and also teaches image recognition (see Col. 1, lines 26-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Campanelli et al. with the comparison methods of Ni to utilize the processing system to classify the 3D objects into types, to recognize and adapt to each object type, as taught by Ni (see Col. 2, lines 3-6).

Response to Arguments

1. Applicant's arguments filed December 10, 2002 have been fully considered but they are not persuasive.

Regarding the 35 U.S.C. 112, 2nd paragraph rejection of Claim 1, Examiner withdraws the rejection, and agrees with Applicant's arguments that the claim language is merely broad, not indefinite.

Regarding Claims 1, 2, 4-10, 12, 16, 17, and 24, Applicant argues that Campanelli does not teach a sample volume, but instead teaches a two-dimensional plane to be imaged. Examiner asserts that Campanelli teaches the symbol located "on a label or on the surface of an article" (see Col. 1, lines 27-29), as Applicant has also noted- since an "article" is three-dimensional, it is

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considered as a "volume", and hence Campanelli's optics are individually focused on the surface of the sample volume. In addition, Examiner maintains that respective focal planes are used for focusing in the sample volume, as noted in Campanelli (see Col. 8, lines 32-35). Further, Examiner directs Applicant to Col. 7, lines 15-21, where Campanelli teaches scanning the symbol when "the symbol is positioned in a skewed pattern with respect to the plane of the array"- hence, the symbol encompasses three dimensions, having a specific and different depth at each point on the plane of the symbol with relation to the imaging system. In addition, although reference (38) is defined originally as a lens and later as a detector by Campanelli, Applicant also argues that Campanelli does not teach a plurality of detectors- Examiner interprets that Campanelli inadvertently used (38) instead of (37) for defining the detector, and further directs Applicant to correctly-referenced Fig. 3b where a detector array (45) is used to detect an image segment from a specific focal length (see Col. 7, lines 7-22). Therefore, Campanelli also teaches the plurality of detectors, as stated in Claims 1 and 24. Hence, Examiner maintains that Claims 1, 2, 4-10, 12, 16, 17, and 24 remain anticipated under 35 U.S.C. 102(b) by Campanelli.

Regarding Claims 3, 11, 13-15, and 18, since Examiner maintains that Campanelli teaches a "sample volume" as explained above, Claims 3, 11, 13-15, and 18 remain obvious under 35 U.S.C. 103(a).

Examiner notes that Claim number 24 was inadvertently omitted from the list of claim numbers as rejected under 35 U.S.C. 102(b)- however, due to a lack of response on this issue by Applicant, it appears that Applicant correctly assumed that Claim 24 was to be included under the 35 U.S.C. 102(b) rejection.

Conclusion

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (703)306-3441. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703)308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7724 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

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SY
February 6, 2003


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